BIBLIOGRAPHY

[0097] [1] K. D. Hobart et al., "Ultra-cut: A simple technique for the fabrication of SOI substrates with ultra-thin (<5 nm) silicon films", Proceedings, 1998 IEEE International SOI Conference, October 1998.

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1. Method for producing a multilayer on a receiving substrate, which method includes the following steps:

the formation of an initial substrate comprising a first material layer formed on the surface of a supporting substrate made of a second material, wherein the first material has an evaporation temperature higher than the evaporation temperature of the second material,

molecular adhesion bonding of the surface of the initial substrate comprising the first material layer to the bonding surface of a receiving substrate to obtain a bonded structure,

partial removal of the initial substrate so as to leave a thin film of said second material on the first material layer,

evaporation of the second material thin film with a selective stop on the first material layer, which evaporation is carried out at a temperature higher than or equal to the evaporation temperature of the second material, and lower than the evaporation temperature of the first material,

growth of at least one layer from the first material layer bonded to the receiving substrate, with the evaporation step and the growth step being carried out in the same technological apparatus.

2. Method for producing a multilayer according to claim 1, characterised in that the second material supporting substrate is a second material substrate or a second material layer formed on a predetermined substrate.

3. Method for producing a multilayer according to claim 1, characterised in that it also includes, before the bonding step, a step of forming at least one additional layer on the first material layer.

4. Method for producing a multilayer according to claim 1, characterised in that the receiving substrate also comprises at least one layer on its bonding surface.

5. Method for producing a multilayer according to claim 1, characterised in that the surface of the second material supporting substrate comprising the first material layer and/or the bonding surface of the receiving substrate also comprise(s) a Bragg mirror formed by an alternation of thin films with different refraction indices n_1 and n_2.

6. Method for producing a multilayer according to claim 1, characterised in that the step of partially removing the initial substrate is carried out by the implantation, prior to the bonding step, of gaseous species in the second material supporting substrate, and by performing thermal annealing of the implanted bonded structure obtained, at a temperature lower than the evaporation temperature of the second material and/or by applying mechanical stresses to the bonded implanted structure.

7. Method for producing a multilayer according to the previous claim, characterised in that the gaseous species are selected from H, He, noble gases, and so on.

8. Method for producing a multilayer according to claim 1, characterised in that the step of partially removing the initial substrate is carried out by a mechanical-chemical thinning of said initial substrate until a second material thin film is obtained on the first material layer.

9. Method for producing a multilayer according to claim 1, characterised in that the step of growing said at least one layer on the first material layer is carried out by molecular beam epitaxy (MBE) or by metal organic chemical vapour deposition (MOCVD), or by PECVD.

10. Method for producing a multilayer according to claim 1, characterised in that the first material is AlAs, Si, etc.

11. Method for producing a multilayer according to claim 1, characterised in that the second material is GaAs, Si_xGe_{1-x}, InP, Ge, etc.

12. Method for producing a multilayer according to claim 1, characterised in that the receiving substrate is made of a material selected from silicon, glass or ceramic.

13. Method for producing a multilayer according to claim 1, characterised in that the at least one layer formed on the bonded first material layer is made of a material selected from GaAs, AlAs, Si, SiGe or SiO_2.

14. Resonant cavity structure characterised in that it includes an active layer, which transmits or detects light, interposed between two reflecting mirrors, which structure is produced using the method of production according to claim 1.

15. Resonant cavity structure according to the previous claim, characterised in that the two reflecting mirrors are Bragg mirrors obtained from thin films of which the materials are selected from Si_3N_4, SiO_2, TiO_2, Si or HfO_2.

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